Ehrlichiosis/Anaplasmosis

Agent(s): Bacteria belonging to the family *Anaplasmataceae. Ehrlichia chaffeensis* infects monocytes (a type of white blood cell involved with immune function) and causes an illness called human monocytic ehrlichiosis (HME). *E. ewingii* infects granulocytes (a different category of white blood cells) and causes a disease referred to as an *E. ewingii* infection. *Anaplasma phagocytophilum* also infects granulocytes, causing an illness called human granulocytic anaplasmosis (HGA).

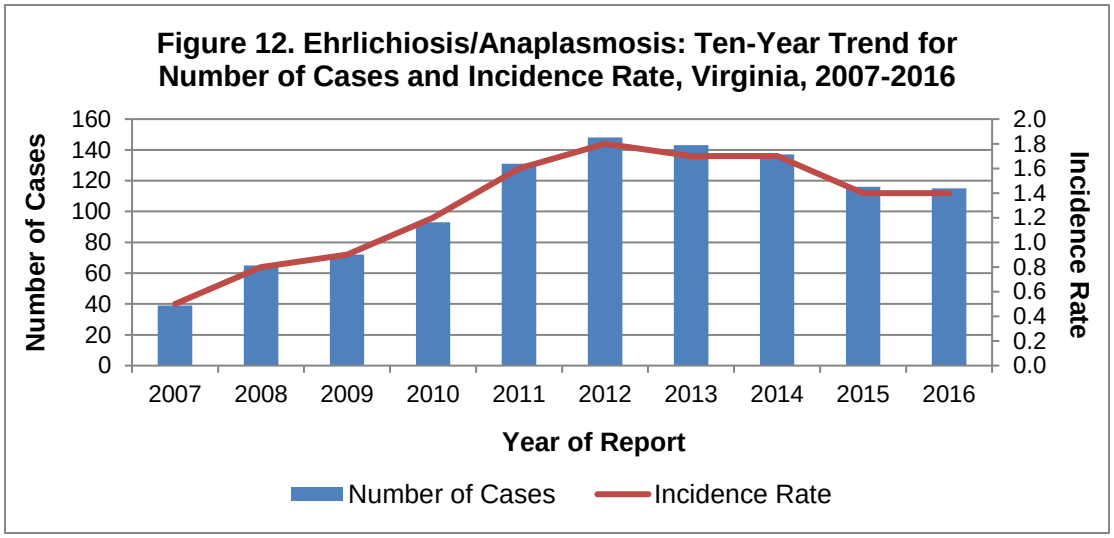
Mode of Transmission: Transmitted to humans through the bite of an infected tick. *E. chaffeensis* and *E. ewingii* may infect adult and nymph stage lone star ticks and be transmitted to a host. *Anaplasma phagocytophilum* may infect nymph stage and adult blacklegged ticks (a.k.a., deer ticks) and is primarily transmitted by the nymph stage ticks. Transmission of these pathogens occurs when an infected tick bites a person and feeds on that person and remains attached for more than 24 hours.

Signs/Symptoms: Illness symptoms commonly include the sudden onset of fever, accompanied by one or more of the following symptoms: headache, body aches, nausea, vomiting and rash. In cases of ehrlichiosis, a rash may occur in up to 30% of adults and 60% of children; rashes are rare in cases of anaplasmosis. Patients may exhibit signs of thrombocytopenia (low blood platelet count) and leucopenia (low white blood cell count) and have elevated liver function test results. Severe forms of illness can result in meningitis/encephalitis, bleeding disorders, difficulty breathing, organ damage and death. Persons with weakened immune systems are prone to develop more severe disease. Persons who do not have a spleen have a high risk of death.

Prevention: Common practice should include minimizing tick bites by recognizing and avoiding the habitats of lone star ticks and blacklegged ticks. These habitats include humid forest environments with undergrowth or heavy leaf litter, and tall weeds, grass and vegetative ground cover along shady forest margins, tree lines, forest trails and forest clearings. As ticks are always found at shoe level, it is best to wear permethrin treated shoes, socks and pants, with pants legs tucked into the socks. If long pants are not worn, repellents containing DEET, Picaridin, BioUD, IR3535, or oil of lemon eucalyptus are effective against ticks and should be applied to exposed areas of skin on the legs before entering tick habitats. After visiting tick habitats, a person should remove and wash clothing, thoroughly check all body surfaces for ticks and, if found, carefully remove attached ticks as soon as possible.

Other Important Information: Due to the many difficulties associated with diagnosis and testing of tick-borne diseases, cases of ehrlichiosis or anaplasmosis may be misdiagnosed as Rocky Mountain spotted fever (RMSF). However, based on tick infection surveys, ehrlichiosis is thought to be much more common than RMSF in Virginia.

Ehrlichiosis/Anaplasmosis: 2016 Data Summary	
Number of Cases:	115
5-Year Average Number of Cases:	135.0
% Change from 5-Year Average:	-15%
Incidence Rate per 100,000:	1.4



In 2016, 115 cases of ehrlichiosis/anaplasmosis were reported in Virginia. This is similar to the 116 cases reported in 2015 and represents a 15% decrease from the five-year average of 135.0 cases per year (Figure 12). The decline in reported cases over the past three years can partially be attributed to fewer cases of ehrlichiosis. The decrease in ehrlichiosis cases might further be explained by unusually colder temperatures during recent winters in Virginia and the subsequent effect on the lone star tick population, the natural carriers of the ehrlichiosis agent. Lone star ticks are normally found in the warmer southeast areas of the U.S., and are not tolerant of extremely cold conditions. In contrast, the northern blacklegged tick is the natural carrier of the bacteria causing anaplasmosis in Virginia. This tick species spread into Virginia from the north and is relatively resistant to cold weather, so the lower temperatures have had less impact on blacklegged tick populations and the number of human anaplasmosis cases in recent years. Among ehrlichiosis/anaplasmosis cases reported in 2016, 93 (81%) were specified as HME, 16 (14%) were specified as HGA, and 6 (5%) were ehrlichiosis/anaplasmosis unspecified.

In 2016, ehrlichiosis/anaplasmosis incidence rates were highest in the 60 year and older age group, with 3.5 cases per 100,000, followed by the 50-59 year age group, with 2.2 cases per 100,000. Together, these two age groups accounted for 74% of all cases. The younger age groups had the lowest incidence rates. This predominance of illnesses among those 50 years of age and older is typical of what is observed for ehrlichiosis and anaplasmosis in other endemic areas in the U.S. Race information was not reported for 48% of cases. Among those with a known race, incidence in the white population (0.9 per 100,000) was higher than the rate in the black population (0.2 per 100,000). Incidence was higher among males than females (1.8 and 1.0 per 100,000, respectively).

Cases were reported from all regions of the state. The highest incidence rate (2.4 per 100,000) was observed in the southwest region followed by the northwest region (2.1 per 100,000). Rates in the remaining three regions ranged from 0.5 to 2.0 per 100,000, with the central region seeing an increase from last year to a rate of 2.0. While the incidence rate for the southwest region was highest among all regions, the map below shows reported cases occurred mostly along the eastern part of that region (east of the Blue Ridge

Mountains). Likewise, for the northwest region, reported cases occurred in localities located along the eastern edge of the region, and not from localities located along the western edge. In the eastern region, the incidence rate was higher on the Eastern Shore than in any other locality in that region. The largest proportion of cases (49%) had symptom onset in the third quarter of the year, while 43% had symptom onset in the second quarter. The second and third quarters represent the spring and summer months, when ticks are most likely to feed.

Ehrlichiosis / Anaplasmosis Incidence Rate by Locality
Virginia, 2016